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BIOGRAPHY

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Medical Life

November

1937

206th Issue of New Series

Charles Bell Number

Charles Bell and the Origin of his

Engravings of the Arteries

By HAROLD WELLINGTON JONES

With Fifteen Illustrations

University of Alabama

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Medical Life

COMBINING MEDICAL REVIEW OF REVIEWS

The only monthly Journal of Medical History in the English language.
Founded and Edited by VICTOR ROBINSON, M.D., Professor of History
of Medicine, Temple University School of Medicine, Philadelphia.

NEW SERIES

ISSUE 206

Charles Bell Number

Vol. 44, No. 11.

November 1937

Published by Froben Press, 4 Saint Luke's Place (Greenwich Village), New York, N. Y.
Single copy, fifty cents; annual subscription, three dollars. Entered as second class
matter December 13, 1922, at the post office at New York, under the Act of March 3, 1879.

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Charles Bell and the Origin of His Engravings of the Arteries

By COLONEL HAROLD WELLINGTON JONES, M.D., F.A.C.S.

Medical Corps, U. S. Army; The Librarian, Army Medical Library

Forty years ago a prosector of anatomy picked up a nerve in a dissection of the chest and arm which had been made by a somewhat discouraged medical student, and inquired, "What is this?" Receiving the reply that it was the long thoracic, he was still unsatisfied nor did his displeasure evaporate until the name of Bell had been uttered. Thus was I introduced to that great anatomist and consummate artist Sir Charles Bell.

Much has been written upon the man, and his life has been so well studied there is little to add that has not been already told and well told. He was one of the marvels of his age, and it may be said safely, I think, that none more versatile ever came on the medical horizon, combining as he did the qualities of the skillful surgeon, the keen and logical physiologist and the superb anatomical delineator and artist. Not content with his eminence as medical practitioner and anatomist, he went far afield, and his "Anatomy of Expression" and "Anatomy and Philosophy of Expression as Connected with the Fine Arts" still stand as classics, after the lapse of one hundred and thirty years.

Charles Bell was born in Edinburgh in November 1774. He was one of six children, three of whom became eminent in after years. His brother John, with whom his name is often associated, was himself an anatomist and surgeon of distinction and an author too, but his talents were overshadowed by the genius of Charles.

The character of Charles Bell, his early life and his artistry have been charmingly portrayed by one of his biographers, Doctor Eugene R. Corson of Savannah, who says of him that "He shows us a harmony, an equipoise of the moral, emotional and intellectual man, quite as rare as the quality of his genius and one looks in vain . . . for the disturbing factors to the full play of his powers. On the contrary I found a deep religious nature, great optimism with great confidence in self. . . ." This sums up in words which it would be hard to improve upon, the character of the genius who was to rank for all time in the company of the great as an anatomist, surgeon, and last but not least, an artist.

It is probable that Bell began his anatomical studies early in 1797 when he was twenty-three. In 1798 he published "A System of Dissections." The Army Medical Library does not possess the first edition, but the second edition published in 1799 is in the collection. It has twenty plates illustrating dissections of the body, all of them approximately 10 by 16 inches. Plate I is undated. Plate 2 bears a date of November 1797, thus placing Bell's earliest engravings during the year 1797. The illustrations themselves are beautifully accurate and clear and evidence, as Dr. Corson says, "The maturity of genius in his (Bell's) youth." Moreover, the dissections, with the facial expressions of the subjects drawn as none but Bell could portray them, are almost tragic in aspect. Who indeed but a supreme artist could immortalize for all time, a nameless pauper perhaps, and invest him with dignity as he submits his body to be dedicated to the science of medicine?

Bell's works are replete with beautiful illustrations. Besides those found in the many editions of his "Anatomy of Expression," his "Anatomy of the Brain" contains twelve beautiful plates, most of them in colors and executed in 1802. One cannot examine Bell's "System of Dissections" without a sure appreciation of his keenness of observation and his aptness of expression. Read what he says of the responsibilities of the Surgeon in connection with his dissections of the arteries: "To the Surgeon, dissection of the arteries is not merely most necessary but quite indispensable. Both heart and head must be wrong when a young man allows himself to be put in situations of great responsibility without having dissected the arteries and thought maturely of the chance of war and of the great variety of open and oblique and torn wounds of the great vessels, which occur in domestic life." Surely good advice even today. Again, for a pithy observation on impotence, I commend the following: "It may be sufficient to hint, that absolute conviction of success must precede the accomplishment and that such an admiration of the object as would make her more than woman makes a man less than himself." I submit that it has not been better put these one hundred and forty years.

The very beginning of Charles Bell's career as an artist-anatomist lies before me, a little book or atlas if you will, con-

taining his first water color sketches. The thin volume looks not unlike a book of accounts, with its red back and grained paper cover. It contains forty-five pages of good linen paper $7\frac{1}{2}$ by $10\frac{1}{2}$ inches, but what a surprise comes to the reader when he opens it! I handle it reverently, almost with awe, for here are Bell's paintings, his handwriting, his first work on the illustrations of the arteries, soon to make him famous. There seems little room for doubt that everything in this book is the work of Charles Bell, although there is neither date nor signature, and the writing is of that copper-plate character of those far off times when if you wrote at all, you wrote well. It might indeed have been your or my grandfather's handwriting.

The small book was acquired by the Library twenty-five years ago by Doctor Billings two years before his death, and came from the collection of Doctor Thomas Windsor of Manchester, England. When received here, the book had a slip of paper attached, stating it to be the work of Sir Charles Bell. Inside I found some loose typed sheets which give a brief description of the contents stating that "the script and drawings are regarded by Doctors H. A. Kelly and Eugene R. Corson as undoubtedly the work of Sir Charles Bell." A few interpolations in pencil appear which give a clue to the writer who was without doubt Colonel Garrison, from an examination of the handwriting. Doctor Corson says, "The accompanying script, which is his own handwriting in my judgment. . . ."

In my opinion there can be no question of it. The handwriting is exactly as the writing of his signature. In addition, in the explanation of Plate 4 (negro's head) there appears in the original "Finding in the head of this black . . . I took this sketch. . . ." In other places of the original text the pronoun *I* appears also. Who was *I* but Bell himself? I have gone over the book inch by inch with a glass and nowhere can I find anything to mark the year, the place or the author. However, I think Dr. Corson is right, it was done in Edinburgh before 1800, probably at the same time as the plates for the "System of Dissection," 1797 to 1799, perhaps even earlier.

The remarkable thing about the book is of course the water color plates of which there are twelve. The study I have made of them was quite accidental and entirely unintentional, but I

shall not forget the thrill of delight when the book was first placed in my hands.

More than twenty years ago Dr. Eugene R. Corson of Savannah published an excellent description of a number of the plates drawn by Charles Bell and reproduced several of the originals in Bell's Atlas. At the time Dr. Corson studied the Atlas it was thought to be entirely Bell's handwork. This belief has, I think, ample confirmation.

The present study is to show the illustrations in the Atlas in their entirety as thoroughly as modern photographic processes can do it, and to offer as well some of the original script in comparison with the later published book on the "Illustrations of the Arteries" which passed through several English and American editions. Unfortunately the cost of reproducing the beautiful paintings in color proved prohibitive and the idea was regretfully abandoned.

Plate 1, the first of Bell's water color drawings shows two views of the heart and great vessels, in seven or eight shades of color. The drawings are roughly five inches square. As far as I know it has never been reproduced although it served as a guide for Plate 1 of the "Engravings of the Arteries" published in 1801 by Charles Bell. The full title of the book is: "Engravings of the Arteries Illustrating the Second Volume of the Anatomy of the Human Body," by J. Bell, Surgeon, and serving as an "Introduction to the Surgery of the Arteries" by Charles Bell, Surgeon. The engravings are only one-half the size of the original drawings and although done by Bell himself the reduction in size has resulted in the loss of much of the individuality and certainly a great part of the artistry of the published work. The virility and sense of depth have largely disappeared. Some alteration has taken place in the drawing. It is more conventional. Bell's original drawing of the heart and aorta with its branches is so lifelike one almost expects to see the blood dripping from it!

The text of the explanation of the plate, as published in the First Edition of 1801 "Engravings of the Arteries," is practically word for word showing that the Atlas served not only as "copy" for the illustrations in the book "Engravings of the Arteries," but that the Book of Drawings actually contains the original text

of the First Edition. In the original text, referring to the heart, we find in Bell's handwriting, the explanation of the drawing. "The Arteria Innominata giving off the sub-clavian and Carotid of the left side" which corresponds to the drawing.

In the first English edition references to the Innominate artery is omitted and under the letter I, we find "The sub-clavian and carotid of the Right Side, rising from the aorta," certainly not an improvement. The thoracic duct shows beautifully in Bell's original drawing, as may be seen in Fig. 1 of Plate 1, and is omitted altogether in Fig. 1 of Plate 1, first English edition, published in 1801.

In Figure 2 of Plate 1 and explanatory text, both the superior and inferior vena cava appear; in the illustration and text of the First Edition the inferior is omitted. The thoracic duct in the original is again shown "where it lies upon the spine near the aorta." In the First Edition it is not seen and no reference is made to it. In all, in the original there are thirty-two lettered references to the drawings—in the First Edition twenty-seven.

In John Bell's "Anatomy of the Human Body" published in 1797 there are a number of drawings of the heart, all in black and white. I find three of them by John Bell himself (Nos. 5, 6 and 9). Number six is not unlike the drawing of the heart in Charles Bell's Atlas. Plates 14 and 15 may have been drawn by J. Bell (the letter J is missing), but at the right of the page is: "Cha. Bell S C" showing that Charles was busy drawing hearts possibly by 1796. Apparently the brothers were not ungenerous toward one another!

The British edition of 1806 of the "Engravings" is exactly the same plate as in the edition of 1801 except as to coloring, a portion of the venous system being in slate blue instead of yellow. In the American Editions of 1812 and 1816 the color process is not nearly as good and in the 1816 edition (the plate made in 1812) the comparison with Bell's original drawing is as the old "chromo" to the colored rotogravure of today.

In Robbi's Leipsic edition (1819) published in Latin, "Descriptio Arteriarum—Caroli Belli," the illustrations of the heart by J. F. Schröter are pitiful attempts at imitating Bell's work and their departure from the originals needs no comment once they are placed on view. They are neither accurate nor artistic.

Plate 2 shows a semidiagrammatic sketch of the arterial system. In all the editions of the "Engravings," both English and American, this drawing is credited to Cheyne. (Doctor Corson says Charles Cheyney but evidently means Cheyne who was well known as an atomical illustrator.) I think Cheyne merely copied Bell's work, as all the reproductions are almost exact copies of the original. In the original drawing, the work is beautifully executed and one can almost pick up the tubular vessels as they stand out from the page. The drawing has more than 150 letters and figures to mark the references in the text, each letter and figure in Bell's beautiful copper-plate handwriting, and is 14 inches by 5 inches. Even though the drawing represents a schema only, it is so artistically done as to suggest a living thing having legs and arms and hands and feet. I doubt if Charles Bell could draw a geometrical figure without putting art into it.

In the "Engravings," First Edition in 1801, this figure was not reproduced but in the 1806 British edition is appeared as drawn by C. Cheyne. It was not done in colors and while almost a perfect copy is strangely unlike the original. I doubt if anyone could really copy Bell's figures. In the rare American edition of 1812 the same plate appears as in the 1806 British edition. Robbi's Latin edition has an indifferent copy credited to Schröter.

Plate 3 shows a dissected trunk, the sternum reflected back, the anterior portion of the ribs removed as well as the diaphragm. It is drawn to show the aorta including the arch, with the various branches. The internal mammary is also shown upon the reflected sternum. Both kidneys are in situ. Included, is a rather poor drawing of the bony pelvis and the iliacs.

No reproduction of this can be found anywhere. Probably Bell himself decided it could be improved upon. The first and second English editions of the "Engravings" show plates resembling it in some degree, but the diaphragm has been left and the heart and lungs remain in situ, the thoracic aorta not being visible. The heart is badly drawn as if Bell had tried to show too much, the result being that he produced a much poorer drawing than the original which indeed is very creditable and actually does show the structures as they appear. Schröter probably copied a British edition of the "Engravings" which is not in the possession of the Library, for the Robbi Latin edition of 1819 shows Bell

went back to his first love with the entire aorta in situ, for his drawing is an exact copy of the one in Bell's Atlas, except that a head minus the lower jaw has been added.

Plate 4 is in some respects the most interesting and startling drawing in the book. It is that of a negro's head and neck, showing the course of the left carotid and its branches, the temporal and thyroid. The work is all there and Bell's art would not even allow him to close the subject's left eye. Indeed even the mouth and lips seem to ask a question as I look at them and the picture is positively uncanny.

The script accompanying the plate gives the clue to the authorship. It will be remembered that up to this time the descriptive text has merely been "supposed" to be Bell's, since he nowhere signed his name. However, the sentence, "Finding in the head of this black the most common and regular distribution of the branches of the Carotid Arterys. I took the sketch from it." Who was *I* but Bell? Indeed no other. And here is how he excuses the eye and mouth in his portrait, for it is a portrait. "The appearance of the eye and mouth is neither like the living or the dead, but those accustomed to anatomy will perhaps recognize the turgescence of the Injected Head."

He mentions the thyroid gland thus, in a footnote: "This is one of the Glandular bodies the nature and function of which we are entirely ignorant . . . that it is often enlarged and yet harmless." I was under the impression at first that the plate had never been reproduced but I found that Doctor Corson published a photograph of it, in 1914. Neither of the two British editions of the "Engravings" (1801 and 1806) show it and in the American editions of 1812 and 1816 it is likewise absent. However, in Robbi's book heretofore mentioned is found a fairly exact reproduction in colors. No reference is made, however, in the footnotes, as to the source of the drawing but it was probably reproduced by Bell in a later edition than the second British (1806) and copied by Schröter in 1809.

Plate 5 is a very fine dissection of the left side of the head. The original water color is almost 8 by 6 inches. It shows the Common Carotid, Internal and External Carotids and Thyroid and the Temporal and Occipital most beautifully. Even though the integument has been removed from the subject, he still has an

expression of patient resignation which Bell could not forbear to use.

Bell copied this drawing in the 1801 edition of the "Engravings," making it $2\frac{1}{2}$ by 3 inches, and the illustration lost most of its dramatic force in the reduction. The small figure showing the course of the Internal Maxillary artery was omitted. I can find no reproduction of it anywhere, although both the Latin edition and the German edition of Robbi show an almost diagrammatic drawing of the Internal Maxillary, taken perhaps from an edition of Bell's "Engravings" not in the Army Medical Library's collection. Bell probably thought the distortion in the original drawing, which was necessary to show the branches, would not bear reproduction in reduced form.

Plate 6. This shows the distribution of the Internal Carotid. It has been reproduced by Doctor Corson and was copied in reduced form by Bell for his "Engravings." It appears in all editions of Bell's work, American and foreign.

Plate 7. This shows the arterial circulation at the base of the brain. Bell used this in the "Engravings," much reduced, and the color showing only as pale pink in the vessels. All the rich dark red colors showing in the original (the brain is darker than normal in the original) are missing. Bell never used the drawing in his later illustrated work on the brain. He was probably not satisfied with it.

Plate 8. This is a beautiful dissection of the arm, showing the arteries from the sub-clavian to the palmar arch. The small drawing shows the arteries of the scapular region.

Plate 9 contains two figures. Fig 1 shows the opened abdomen with the large intestine, the omental vessels and the under surface of the liver with the gall bladder in situ and the hepatic artery. It is copied in Plate 7, 1st edition, *Charles Bell del* of the "Engravings." The original drawing was reproduced as an etching in January, 1801, and except for the lack of color in the vessels it is a good reproduction of the original. In the 2d edition 1806 the engraving is substantially the same, although the numbering is slightly altered and the arteries more intensely colored. The drawing of the liver, the cystic artery and the blood supply of the omentum is undoubtedly bad, and Bell was certainly far from his best. Even Schröter declined to copy it and

the laconic penciled note at the bottom of the plate in the American edition of the "Engravings" of 1812, I think in Billings' handwriting, "A plate such as this is good for nothing," is a fair estimate of its value.

Figure 2 of Plate 9 shows the left hand with the index finger resting on a book, with the various tendons and vessels described in the accompanying text, the tendons designated by the letters A, B, C, D, and the vessels by numbers from 1 to 9. It does not appear in the 1st Edition, but a similar hand (this time the right) shows as an additional Plate 6 in the 2nd Edition by C. Cheyne. This also appears in Robbi's Latin Edition by Schröter, undoubtedly copied from Cheyne. This was just the thing Bell liked to draw and the hand is as expressive as if it belonged to a schoolmaster expounding his favorite dogma.

Plate 10 is not of especial merit but is a graphic picture of the omentum and arterial circulation of the colon. In the original the coloring is beautifully done, but the coloring in the engravings has never been equal to that in the original.

Plates 11 and 12 show the arterial circulation of the thigh, leg and foot. They have been extensively copied, and the reproductions are found in practically all the editions of the "Engravings of the Arteries."

The Atlas comes abruptly to an end on page 46, with a reference to "Operative Surgery," Vol. II, pages 33-7-8. Bell's first drawings were completed, he was on the threshold of a full life and a useful one. His monumental work on the brain and nervous system was to follow, but here perhaps is the foundation. One closes the book regretfully, reverently, glad to have followed the artist's pen and brush to the last, glad of a posthumous intimate acquaintance with Charles Bell.

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Charles Bell

Explanation of Plate 1st

Front and Back Views of the Heart.

Fig 1st

A view of the Heart, nearly in the Situation in which it is seen when the Breast is opened.

- A The Superior Vena Cava, returning the blood from the head and arms.
- B The Inferior Cava, where it pierces the diaphragm to convey the blood from the lower parts of the body into the right auricle. The three vessels which join the Cava here are the Vena Cava & Hepatic.
- C The right sinus, or Auricle.
- D The Right Ventricle.
- E The Pulmonary Artery, it is seen to divide; one branch to pass under the arch of the Aorta, to the lungs of the right side; the other to take an acute turn to those of the left side.
- F Part of the Left sinus of the Heart, or that

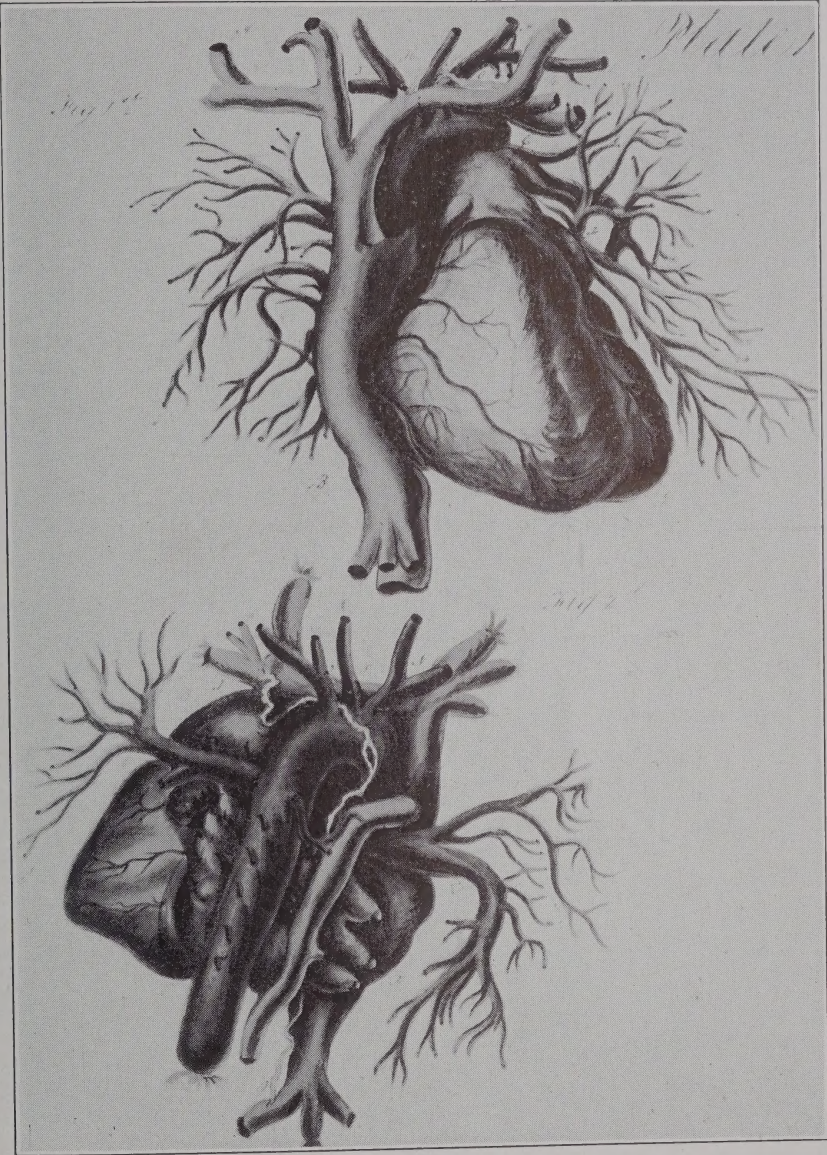


PLATE 1

PLATE 1

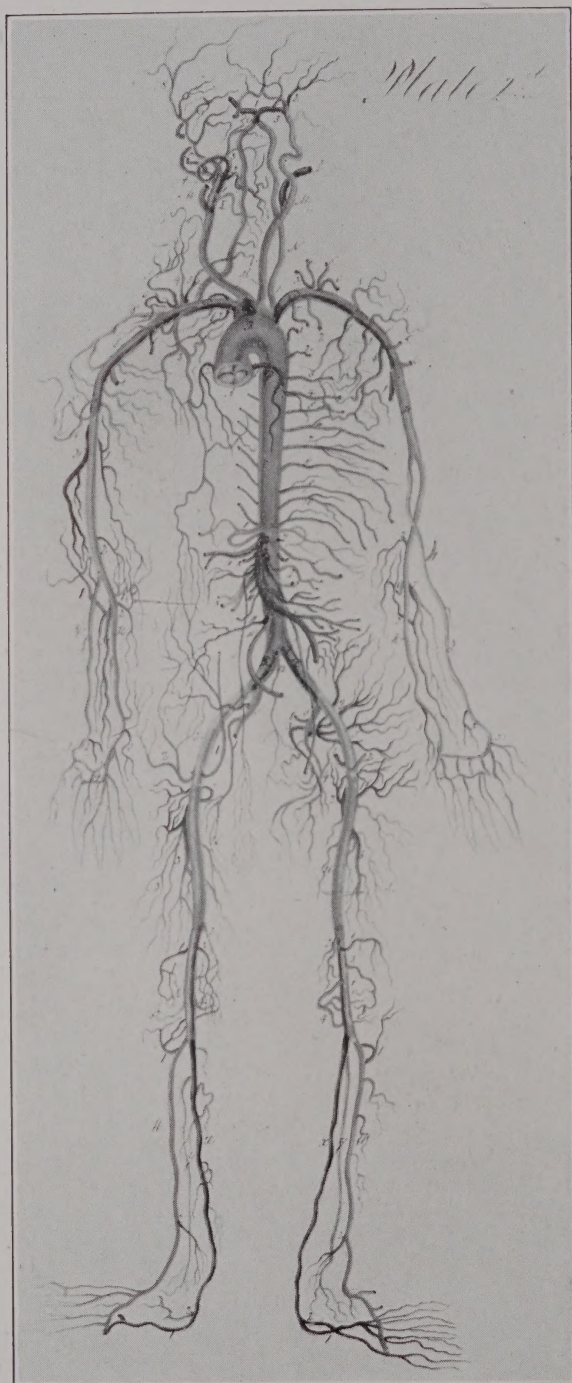


PLATE 2

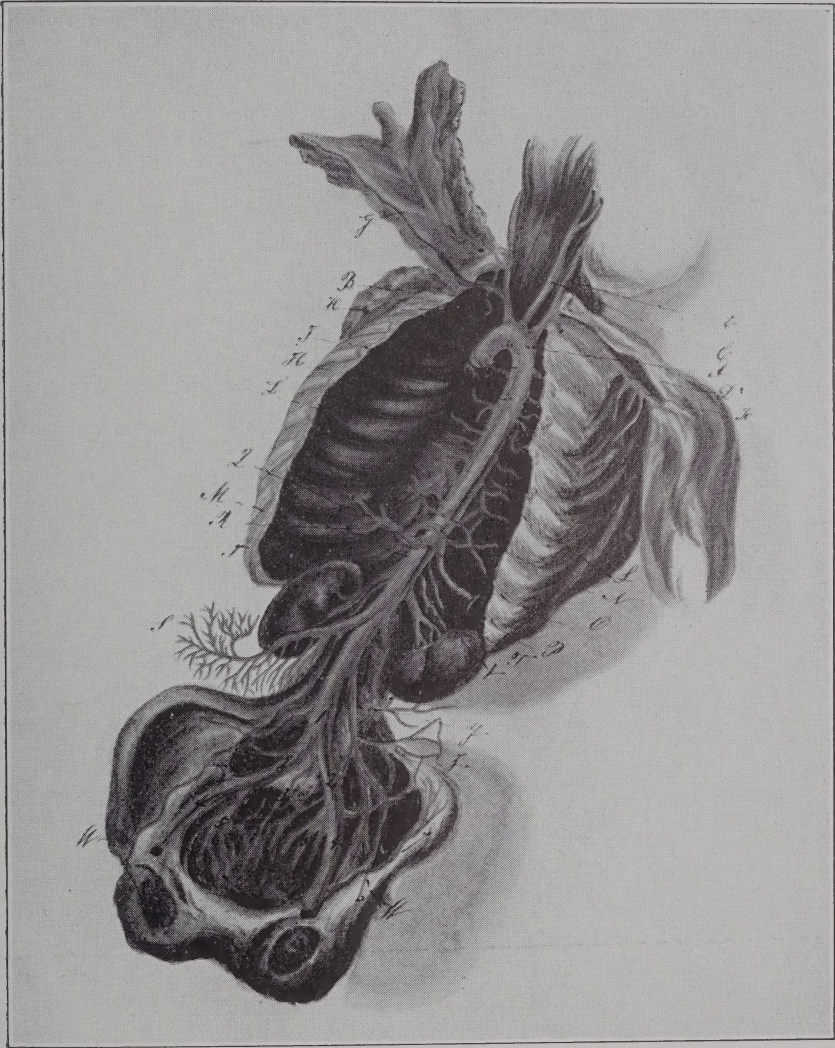


PLATE 3

Explanation of Plate 4th

Finding in the head of this black the most common and regular distribution of the branches of the Carotid Artery, I took this sketch from it. The appearance of the eye and mouth is neither like the living, or the dead, but those accustomed to anatomy will perhaps recognise the turgescence of the Injected Head.

The neck and part of the face is depicted.

A. The Trachea, or windpipe.

B. Muscles of the fore part of the Throat, viz: Sternio-Hyoidens and Sterno-Thyroidens.

C. The Thyroid Gland.

• Thyroid Gland. This is one of the Glandular bodies the nature and function of which, we are entirely ignorant. But it is important to know that it swells with the irregularities of the female system; that it is often enlarged and yet harmless; that it is the seat of the Cancers; that it is sometimes scirrhous and hard, and the cause of suffocation.

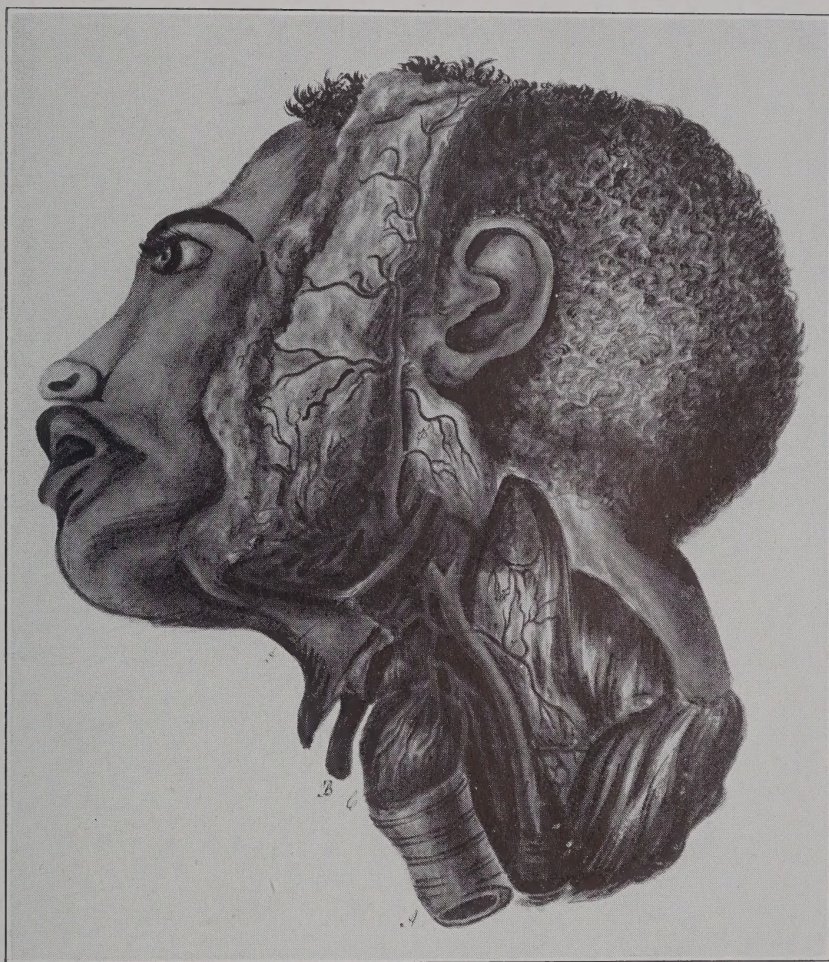


PLATE 4

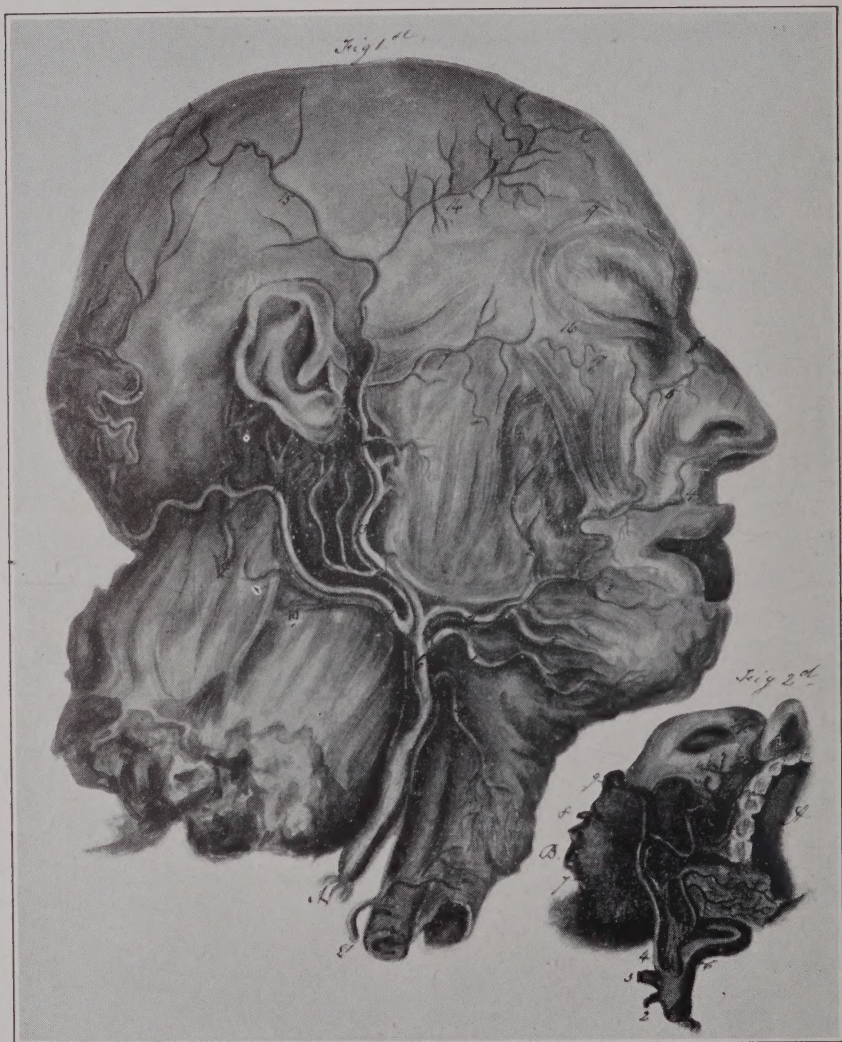


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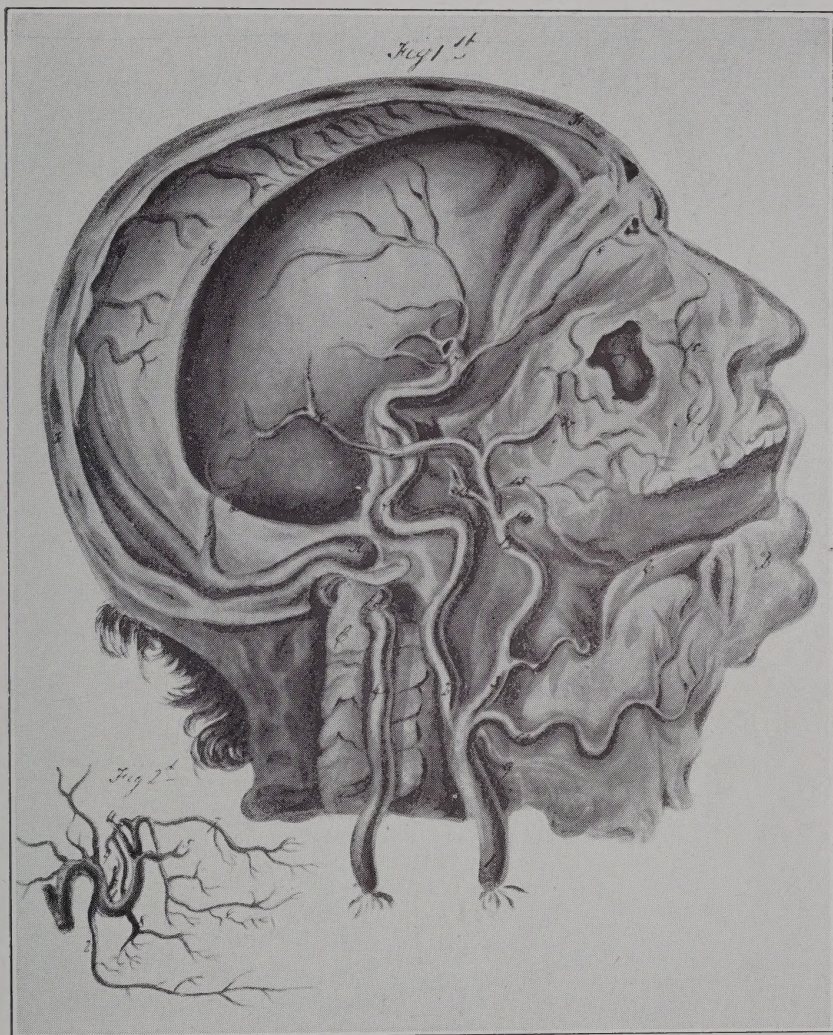


PLATE 6

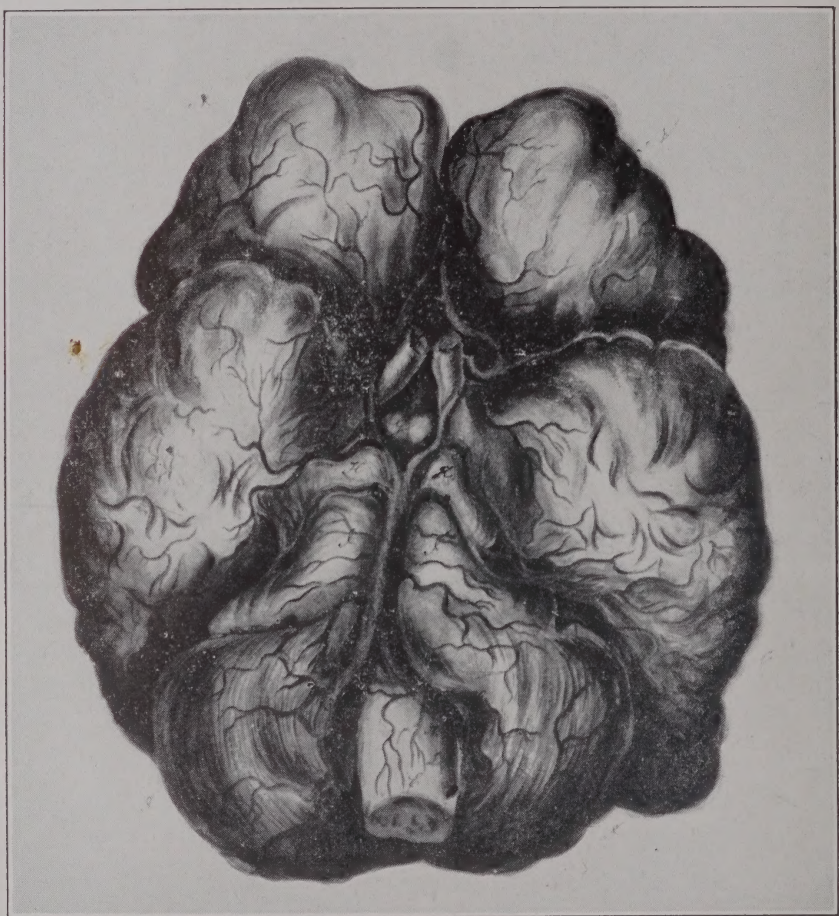


PLATE 7

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PLATE 8

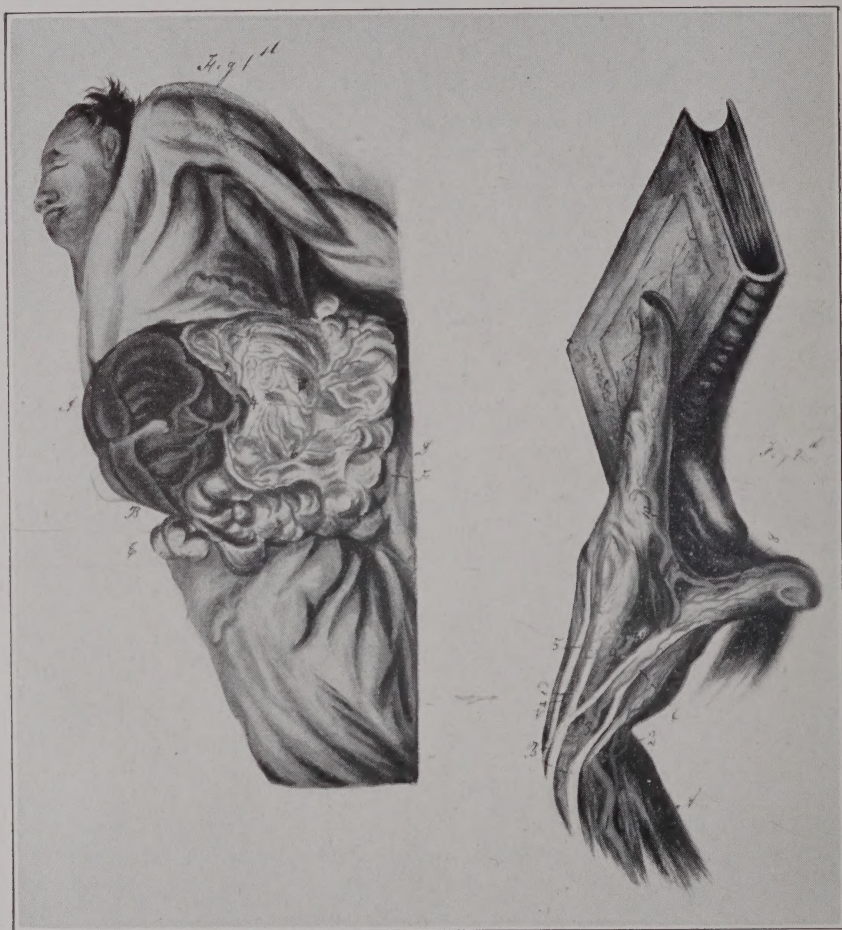


PLATE 9

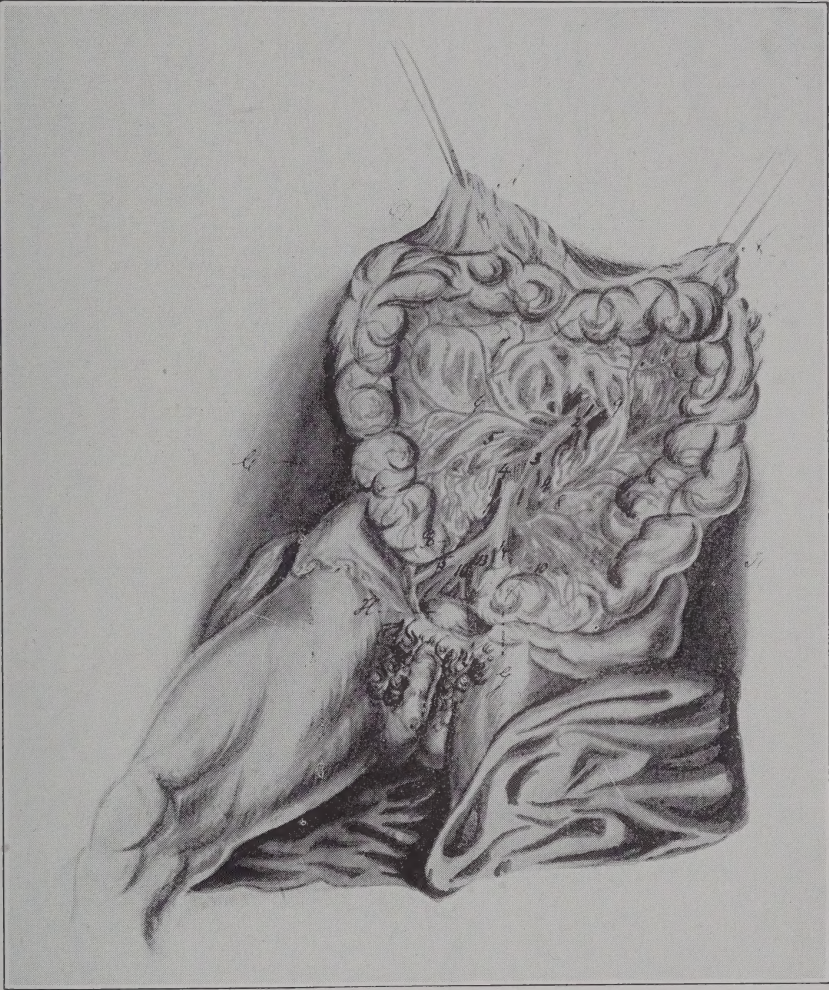


PLATE 10

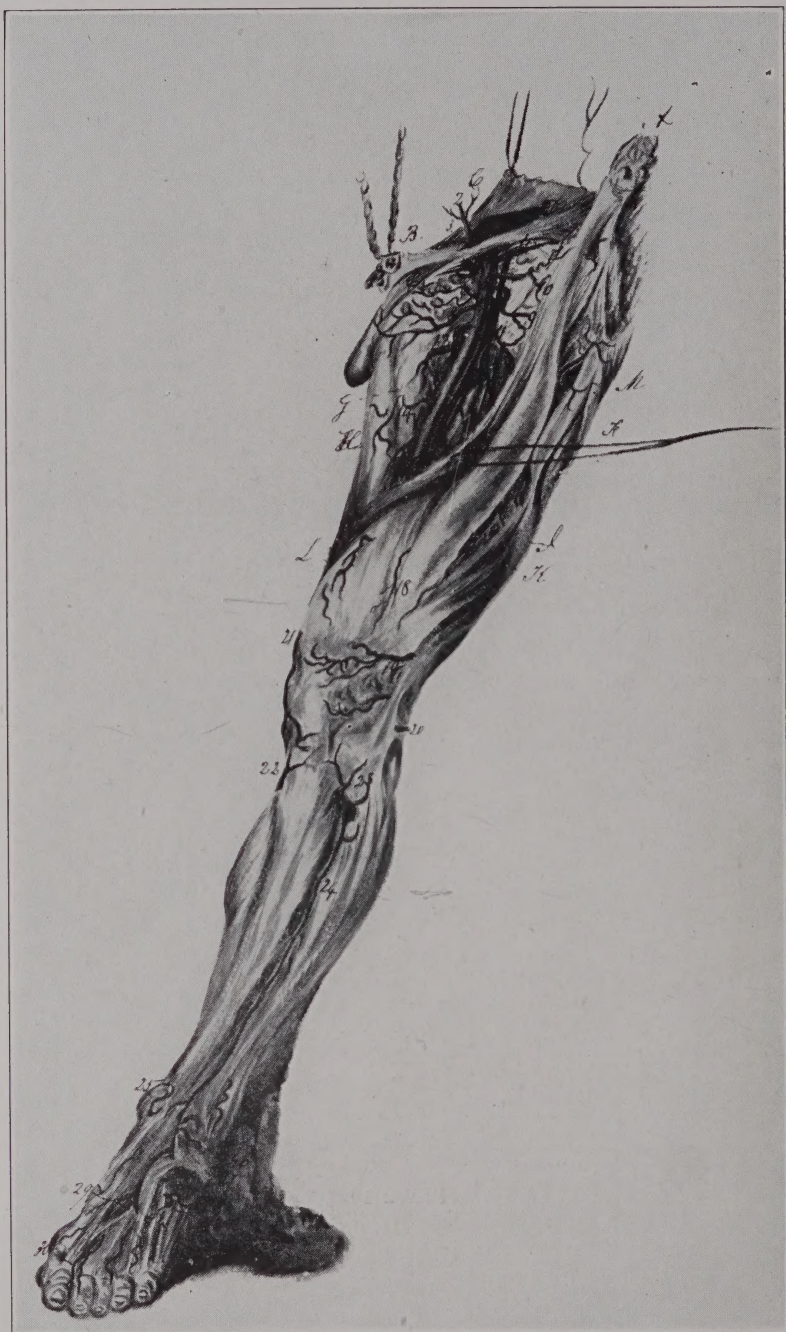


PLATE 11

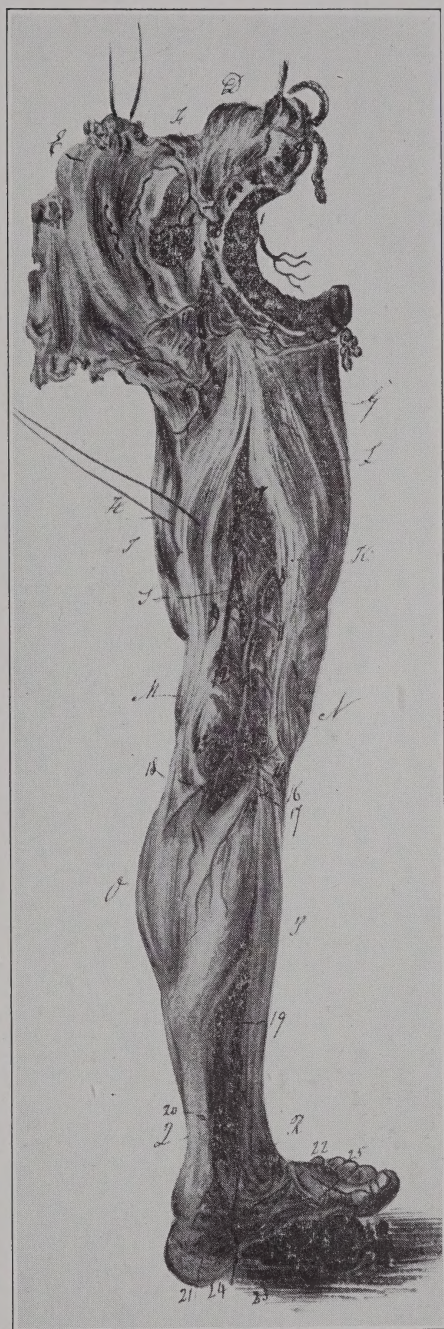


PLATE 12

A HISTORY OF WOMEN IN MEDICINE

From the Earliest Times to the Beginning of the Nineteenth Century

By KATE CAMPBELL HURD-MEAD, M.D.

As far back as forty years ago Dr. Kate Campbell Hurd-Mead, for many years a practicing physician in Connecticut, became fascinated by the achievements of women in the medical field and, encouraged by the approval of such outstanding men as Drs. Osler, Welch and Kelly of Johns Hopkins University, began what has resulted in a lifetime study. For it required years of personal research through most of the great libraries of Europe, where she found an astounding mass of hitherto unpublished and unknown material hidden away in obscure Greek and Latin manuscripts, and in rare books in modern languages. It required personal acquaintance and correspondence with hundreds of other women physicians in nearly every country of the world. At last, after repeated delays, owing to Dr. Mead's desire to neglect nothing of importance in new research, the result of this study appears in the volume herewith announced, the first, it is hoped, of two volumes, which will together, for the first time, adequately reveal the place of women in the history of medicine.

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The INTERNATIONAL SOCIETY OF THE HISTORY OF MEDICINE, which held its 10th Congress at Madrid (1935), has selected the following officers for the next triennium: Founder-President, Tricot-Royer (Antwerp); Honorary President, Giordano (Venice); Active President, Comoiu (Bucharest); Vice-Presidents, Singer (London); de Lint (Leyden), Capparoni (Rome); Laignel-Lavastine (Paris); Diepgen (Berlin); Secretary General, Guiart (Lyons); Assistant Secretary, Van Schevensteen (Antwerp); Archivist, Fosseyeux (Paris); Treasurer, Boulanger-Deusse (Paris).

The 11th Congress will be held September 2-11, 1938 at *Zagreb, Belgrade, Sarajevo* and *Raguse*. The chief subjects for discussion will be the State of Medical History in the Various Countries, and the History of Paludism in the Balkan Peninsula and particularly in Yugoslavia. The Congress will be under the patronage of the King and of the Academy of Zagreb and of Belgrade.

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